5. SUMMARY AND CONCLUSION

The study was carried out with the following objectives:

i) To find out managerial efficiency of irrigated rice farmers with respect to management components such as planning, labour management, financial management, information management and production management.

ii) To find out the association between managerial efficiency of the farmers and their socio-economic characteristics such as education, farming experience, income, social participation and mass media participation.

iii) To find out the association between managerial efficiency of the farmers and their situational characteristics, namely, location of water source, extent of paddy area, irrigated paddy area, water availability and land fragmentation.

iv) To analyze reasons for non-adoption of managerial functions by farmers and how they are related to the socio-economic and situational characteristics mentioned above.

Under these objectives, the following hypotheses were formulated and they are listed below.
i) Managerial efficiency of irrigated rice farmers is associated with their socio-economic characteristics.

ii) Managerial efficiency of the farmers is associated with their situational characteristics.

iii) The socio-economic and situational characteristics are related to the reasons for non-adoption of managerial functions by the farmers.

The major source of empirical data was interview of farmers practicing irrigated rice farming in the irrigated area under Ichannur canal of Kuttiyadi Irrigation project, located at Ichannur in Chelannur panchayath, Kozhikode Taluk, Kozhikode district in Kerala state. The required data for testing the hypotheses were obtained using an interview schedule from 250 farmers who were selected through stratified random sampling based on four locations of water source as follows: farmers whose paddy area is located at head, middle and tail reaches of irrigation canal and farmers irrigating rice by pumping water from ponds / tanks.

The collected data were processed and analyzed in accordance with the objectives of the study. The major results and their implications are given in the ensuing paragraphs under various components of managerial efficiency of farmers.
I. Planning

One of the managerial functions under this component was planning the quantity of inputs such as seeds, fertilizers etc. to be used based on input-crop yield relationship.

52.8% of the sample farmers adopt such a planning strategy in their rice cultivation. An enquiry into the factors influencing this behaviour identified that higher experience in farming and income status of farmers are strong determinants of this positive approach.

Reasons for non-adoption of the managerial function were also enquired into. Importance given by farmers to traditional knowledge and practices in farming, and incompatibility of the function due to the influence of changes in weather, water availability etc. on crop yield, especially for big farmers were found to be the prime reasons which vitiates the function.

Operation-wise cost calculation before the start of rice cultivation is another index taken to analyse the habit of planning. It was revealed in the analysis that only 45.6% of the respondents resort to this farm management technique. Analyses to find out the association of the managerial function with the socio-economic independent variables showed that it is intimately related to income, farming experience, mass media participation and social participation of the respondents. Among the independent variables, higher income
and better exposure to mass media are conducive for the adoption of the management method. However, the relationship between longer farming experience and the managerial function is in the other way round.

Extent of paddy area and the degree of land fragmentation are important situational variables affecting the planning decision. Big farmers adopt more, and also farmers who have fragmented plots follow suit.

The study has identified certain reasons for not practicing the planning function. Foremost among them is that farmers have not habituated such a practice, which may not be required for farmers whose primary objective behind rice cultivation is sustenance rather than business.

Secondly, farming is carried out under many uncertainties like water availability, climatic conditions, market price fluctuations etc. Hence, such meticulous planning is meaningless. Farmers also expressed their fear of loosing interest in rice cultivation upon performing cost calculations since it is an unprofitable proposition. Small land holdings also contribute to the non-adoption of this management strategy.

Farmers having more cultivated area do not feel the necessity to habituate such a management technique in cost-intensive rice
farming. On the other hand, very marginal farmers consider the managerial function not applicable to their small holdings where cost of cultivation is less.

Even high income farmers perceive non-profitability of rice farming as a disincentive in adopting this type of innovative managerial functions.

Another index considered to analyze managerial efficiency of farmers with regard to planning was selection of variety of rice, which is tolerant to pests/diseases. In this study, it was observed that 83.2% of the respondents under investigation are very particular that the variety should be pest / disease tolerant. This reveals that farmers are well aware of the high cost of application of plant protection chemicals.

The results further revealed positive association of the extent of adoption of this technique with media and social participation level of the farmers. Another background variable found to be associated with the adoption pattern is income, which is inversely related with adoption.

Considering the relationship of adoption pattern with situational variables, small and marginal farmers are found to pay more attention to pest / disease tolerant rice varieties. Fragmented nature of cultivated land and lack of interest in adoption of this
practice are associated. Further, adequate and timely supply of water are deciding factors in selection of the variety of rice – it is to be inferred from the analysis.

The non-adoption of the managerial function was due to certain constraints. The farmers, when confronted by the dilemma between high yielding varieties and pest / disease tolerant varieties, they are found to reject the second option. It is seen that higher educated farmers, by and large, prefer high yielding varieties. Similarly, uncertainty to farmers due to non-availability of adequate quantity of seeds of tolerant varieties and greater water requirement of such varieties also make farmers ignore them.

II. Labour Management

Rice cultivation is a labour intensive activity since it involves many field level operations from nursery preparation up to harvesting and processing of the produce. Hence, procurement and judicious application of labour of good quality much determine the success in rice farming.

One of the functions of labour management in this study relates to fixing up labourers in advance. In order to overcome the problem of labour availability during peak periods, managerially efficient farmers procure labour in advance. 58.8% of the sample
farmers adopt this management strategy, while the rest of them do not bother to do so.

An overwhelming majority (69%) of high income farmers resort to this method of labour procurement. Those who have high social and mass media participation are also better adopters of this management strategy. It is interesting to note that small and marginal farmers are more serious in adopting this policy than big farmers who usually have their own labour force at their disposal at any time.

Upon analyses of reasons for not adopting this labour management function, it is found that farmers having low income status get the migrant labourers from states like Tamil Nadu at cheaper rate. Farmers having small land holdings require less labour and hence, they do not feel the need for this labour management strategy.

Another measure of labour management efficiency studied in the research relates to utilization of family labour for agricultural operations. A major chunk (70%) of the farmers resort to this practice. In one sense, this mitigates the problems of getting hired labour and the high labour cost involved.

The method of utilizing family labour is more prevalent among the lower educated category of farmers. Other social and situational characteristics considered in this study do not contribute to significant variation in adoption of the managerial function.
The enquiry as to why the respondents are reluctant to implement this method elicited the response that family members are busy otherwise, and they are disinterested in rice cultivation, which is nose diving to poor profit. Because of this, farmers themselves are also not motivated to put their family in this vocation.

Giving instructions to labourers to carry out various agricultural operations is another labour management practice conceptualized under managerial efficiency of farmers. This assumes relevance in a crop like paddy, which involves specialized operations such as nursery preparation, transplanting seedlings to main field, maintenance of particular depth of standing water in the field and so on.

The importance of instructing labourers is well evident from the study since 87.6% of sample farmers undertake this practice. It is observed that giving instructions does not seem to be so relevant for very marginal farmers having less than 0.2 hectares of land. However, timely availability of water, which ultimately influences implementation of agricultural operations is an important determinant of this labour management practice.

Upon enquiry with farmers who do not give instructions to labourers, it is understood that they have confidence in experienced labourers. On the other hand, some farmers believe in demonstrating
work to labourers and not in oral instructions. However, farmers who have their entire paddy area under irrigation and hence, get more of crop production are not very concerned about demonstrating.

III. Financial Management

Rice farming in Kerala state is beset with high cost of cultivation and low returns. Hence, arranging the required money and its meaningful allocation will go a long way in helping farmers to improve their farm management so as to sustain in the farming sector.

In this study, farmer's behaviour of noting down expenditure incurred for agricultural operations is one of the indices of financial management efficiency. Only 37.2% farmers are practicing this strategy, while the others (62.8%) do not seem to be bothered about it. This, in a way, reveals the incompatibility of this management technique to the sample, which is primarily made up of marginal and small farmers. They are people who do not generally undertake rice cultivation from a commercial or business perspective where such financial decisions may have more of application.

The prominent factors promoting adoption of this managerial technique are higher levels of education, social and mass media participation of farmers.

Non-adoption of this management technique it due to certain reasons. A good proportion (42.7%) of farmers are able to memorize
the expenses without necessarily writing them down. Some others have not just habituated the managerial practice. This is more applicable in the case of farmers having high income status. There are also farmers who do not perceive the need to practice this in small cultivated holdings. Fear of losing interest in rice cultivation upon noting down expenses is also a disincentive in the adoption of this management function.

Another financial management function considered in the study is working out profit/loss from rice cultivation. Even though this is a very sensitive management strategy in a non-profitable farming system, the study shows that a good chunk of the sample farmers (63.6%) adopt it. Enquiry into the characteristics, which influence its adoption revealed that farmers with high income and media participation tend to favour adoption of the practice. However, it is the other way round for those who maintain high level of social participation with other farmers, who may also be constrained due to the low returns from rice cultivation. Very marginal farmers are also not found to be much concerned about adopting this management technique.

An analysis of reasons for non-adoption shows that farmers who cultivate rice for household use and not for sale do not value this management strategy. Some farmers feel that working out returns will end up in desertion of paddy cultivation, which is an unprofitable
proposition, while others are there who have not habituated the practice. Another reason for non-adoption denotes that such a managerial function is not relevant in small land holdings where expenses and returns are not high.

Illiteracy of farmers is making them non-habituate the practice of working out profit or loss to a greater extent. The element of uncertainty in crop yield and income due to the problem of water availability for tail reach farmers and for those having less than 50% of irrigated paddy area is contributing to a fear of losing interest in cultivation upon adoption of the managerial function.

Another index of financial management efficiency in the study relates to the procedure of keeping reserve cash for meeting unexpected expenses. The difficulty in having money for this, especially for small scale rice cultivators is evident from the adoption rate (56% farmers) observed in the study.

Analyses of the association between adoption of this managerial decision and socio-economic and situational characteristics showed that it increases with improvement in education, income and mass media participation of farmers. However, big farmers who incur lot of expenses on their routine agricultural operations are not able to adopt this strategy much, when compared to small and marginal farmers. Similarly, farmers having less than 70 percent of irrigated
area and hence, get lower returns from rice cultivation do not find it easy to keep reserve money.

Incompatibility of the managerial practice mainly for low income farmers who also have small cultivated area is highlighted from the reasons for its non-adoption. The capability of farmers to arrange money at the required time from alternate sources is also making them not concerned about keeping reserve capital. Further, the uneconomic nature of rice cultivation is found to necessitate even high income farmers to depend on alternate sources of finance.

IV. Information management

Information is a valuable ingredient in decision making by farmers. Information on the nature, method of use and benefits of modern agricultural techniques will help farmers to overcome doubts about their relative advantage over traditional methods, thus promoting their adoption. Hence, efficient farmers have to be good in information management.

In this study, one of the indices of Information management efficiency is their behaviour of getting information on agricultural practices from mass media sources. An overwhelming majority (94.4%) of the sample farmers adopt this strategy, leaving only 5.6% out of the stream. This indicates the importance assigned by them in
collecting relevant information in order to overcome many of the uncertainties existing in a cost-intensive farming system.

The results further revealed positive association of the extent of adoption of this practice with farming experience. However, with regard to another background variable, namely, extent of paddy area, the relationship is inversely proportional.

Enquiry into the reasons for not adopting this practice has brought to light the following aspects: 50% of non-adopters acquire information based on their farming experience, which would have helped them to build up sufficient information data base. Further, a system of exchange of knowledge among farmers themselves seems to exist, reducing the dependence on mass media sources. This indicates good inter-personal relationships in the farming community without mutual distrust, which has been characterized as a sub culture of peasantry. Illiteracy is also making farmers not interested in accessing mass media information. Similarly, farmers undertaking traditional farming are not found to be concerned about developing their knowledge base on new cultivation methods.

Analyses of variables related to reasons reveals that farmers maintaining higher level of social participation are more interested in gathering information from their fellow farmers. They are also less tradition-bound in rice cultivation.
Discussing agricultural practices, problems and their solutions with fellow farmers is another index considered to study Information management. The results reveal that a high proportion of respondents (76.4%) are conscious about habituating this practice, which indicates the existence of trust among themselves, an important component of their social capital.

Analyses of the association of this management function with socio-economic characteristics show maximum adoption in the case of farmers maintaining high social and media participation. Considering the relationship with situational variables, the highest rate of adoption is seen in the case of farmers having less than 50% irrigated paddy area. They may require more information, particularly on water availability from the irrigation project in order to develop confidence to continue rice cultivation.

Certain bottlenecks have been identified by non-adopters in implementing this social process of information generation. First of all, women farmers do not find it feasible to discuss with other farmers because the opposite sex dominates the study area in terms of numbers. Hence, opportunity for meaningful interaction among themselves is also restricted for women. Lack of time, mainly for farmers who have subsidiary occupations is another constraint. Further, a culture of ‘familism’, wherein, discussions are confined to members of the family for generating information also exists in the
area. This is found to be more relevant for farmers maintaining less social participation. Farmers located at the tail reaches of canal, who face the problem of water availability do not feel that discussions will be helpful in improving water distribution among them.

Another managerial function studied for assessing Information management efficiency of farmers is discussing agricultural practices, problems and solutions with the extension officials of agriculture and irrigation departments. This is important for farmers to update their knowledge base on improved practices and for availing benefits through various schemes implemented by these departments.

However, in this study, it is observed that farmers are not serious about this managerial function, since only 38.4% adopt it. This is not a positive trend, considering the role of extension officials in transferring innovative practices to farmers for increasing their crop yield and reducing cost of cultivation.

Improvement in educational status of farmers is found to lead to higher adoption of the managerial function. A similar influence is seen for income status and social participation of the respondents. It is also observed that farmers located at head reach of canal and those who irrigate through pumping are better adopters than tail reach farmers. The former two categories are at an advantage with respect to both adequacy and timeliness of water availability, which can
motivate them to study modern farming practices propagated by the departments.

The reasons for not practicing this discussion strategy were enquired into. It shows that the department officials are interested in contacting and discussing mainly with farmers having higher income status and cultivated area, many of whom are office bearers of institutions like farmers association, co-operative society etc. Lack of effective communication between officials and farmers is evident from this. Low income farmers are found to be more concerned about this biased contact pattern of officials towards well to do farmers. Non-availability of time to discuss with officials is another constraint reported by farmers who do not adopt the managerial function.

V. Production Management

The management functions under this include adoption of seed rate, fertilizers and irrigation schedule for rice based on the recommendations of agriculture department. These are the inputs contributing to improvement in yield of rice and accordingly, an increase in the farmer's income.

With regard to the managerial function related to recommended seed rate of high yielding rice varieties, the study has shown that only 46% farmers adopt the technique. Hence, by and large, farmers are not very efficient in selection of improved seed as well as deciding the quantity of seeds (seed rate) to be applied.
However, among the farmers who go in for the recommended seed rate, the process of participating in activities of institutions like farmers' association, panchayath etc. is enabling them to improve their adoption rate, as observed from the influence of the variable, namely, social participation.

Enquiry into the reasons for not adopting this management strategy shows that farmers are mainly unaware of the department recommendations on seed rate of paddy. It may also be noted that this is the prominent reason mentioned by small and marginal farmers, the major groups in this study. This is a serious drawback of the extension machinery of the agriculture department. Further, incompatibility of the technique with farmer's traditional practice also exists. This is more applicable to big farmers who have larger landholdings. Another reason for non-adoption is the money they have to pay for recommended quantity of seeds, which is higher than the commonly adopted seed rate. This outlook is there even for high income farmers.

Another index of Production management efficiency in the study relates to adoption of fertilizers in recommended doses. This is an important soil additive for obtaining higher crop productivity in paddy soils which are subject to leaching loss of nutrients available in the soil due to percolation of water.

In this study, it is seen that a comparatively lesser proportion of farmers (36.4%) adopt this technology than seed rate (46%
farmers). This means that 63.6% of farmers do not feel the requirement to apply recommended quantities of fertilizers to improve yield of rice from their farms.

The results further reveal positive association between adoption rate of this technology and the background variables - education and mass media participation of farmers.

The prominent reason for non-adoption of this production improvement technique is also the same as that of seed, namely, unawareness of the recommendation. This is found to be more for farmers maintaining low level of social participation. Once again, the lack of sufficient communication and extension programmes such as field demonstrations, training etc. for farmers from the agriculture department is highlighted from this reason. This is the situation even when Government schemes to promote fertilizer use exist. Other constraints to adoption include high cost of fertilizers, non-applicability of recommendations to field conditions, interest to follow traditional fertilizer management practice and also non-availability of sufficient water for using fertilizers in recommended doses.

The other managerial function considered under Production Management is adoption of recommended irrigation schedule for rice. Irrigation schedule indicates the quantity of water to be applied and the frequency of irrigation. This is the most important production
management technique to be adopted by farmers under irrigated rice farming. However, the study found that 90% of farmers are not adopting this. In view of the above, chi-square test of association between independent variables and adoption of the managerial function was not attempted.

Since such a high proportion of farmers do not practice recommended irrigation schedule, the reasons expressed by them for non-adoption assume relevance. Similar to seed rate and fertilizer recommendations, most of the farmers have reported that they do not have the knowledge on scientific irrigation schedule for rice. Another constraint for its adoption is the absence of the required infrastructure, namely, field channels to supply required quantity of water to individual fields. Other reasons which prevent farmers from using the technique include the problem of getting adequate and timely water, fear of decrease in yield of rice through improved irrigation practices and the difficulty in maintaining a fixed quantity of irrigation water in the fields due to factors such as uneven land topography, field to field method of irrigation practiced etc.

The study has shown that more number of farmers located at tail reach of canal complain about problem of water availability than head and middle reach farmers. Further, lack of co-ordination in activities of irrigation department, which delivers water and agriculture department, which is supposed to both transfer and
facilitate adoption of modern agricultural techniques among the farming community is also evident from the study.

To sum up the study, on the whole, the farmers are efficient with respect to Planning, Labour management, Financial management and Information management in irrigated rice farming. Taking into consideration the rate of adoption of managerial functions under different components of management, managerial efficiency of farmers is the highest for Information management, followed by Labour management, Planning and Financial management. However, they are not found to be efficient in Production management for improving yield of irrigated rice. This is a serious drawback in the case of a crop like rice, especially in Kerala, where high cost of cultivation necessitates increase in crop yield in order to realize higher returns for farmers. It may also be noted that farmers in the study area have not been able to improve irrigation management on their farms, which is the most crucial technology contributing to rice productivity under irrigated conditions.

Income, social participation, mass media participation and extent of paddy area of farmers are the strong background variables determining adoption of majority of the managerial functions of the study.
SUGGESTIONS

Based on the findings of the study, the following suggestions are made:

1. The areas (components) of managerial efficiency considered in the study can be used as the basis for formulation of management development programmes for farmers. The managerial functions under these components may be taken as guidelines in preparation of extension education content in such programmes.

2. Income, social participation, mass media participation and extent of paddy area of farmers were found to influence adoption of majority of the managerial functions contributing to managerial efficiency. Hence, it is suggested that these factors may be borne in mind while selecting farmers for the management development programmes.

3. The study has shown that farmers are not properly aware of scientific recommendations of inputs like seeds, fertilizers etc. for rice cultivation. Hence, it is necessary to enrich the knowledge of farmers on such scientific agricultural practices so as to improve their production management efficiency and achieve higher crop yield.

4. In our study, we find that the contact pattern of officials of the agriculture department is mainly with farmers who have more of
income, paddy area etc. Hence, the extension methods adopted by the department have to be re-oriented to cater to all the farmers, irrespective of their socio-economic status, in terms of awareness creation on various aspects related to cultivation and providing benefits through different schemes. Institutional mechanisms such as Information Kerala Mission, a Government programme envisaged for providing relevant information to the people may be made use of for achieving this objective.

5. Irrigation department should take steps to supply sufficient water at the proper time for farmers located at all the locations (reaches) on canals. For this, the department may promote farmers’ participation in operation and maintenance of irrigation projects.

6. The present study has been undertaken only with regard to irrigated rice farmers. Similar studies may also be taken up in the case of farmers cultivating other crops like cereals, pulses, plantation crops etc. so as to formulate general methodologies for the development of managerial efficiency of farmers.